

Chapter 7. Wetlands, Riparian Areas, and Vegetated Treatment Systems

7.1 Introduction

Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands, which do not fall under the definition of isolated wetlands, are regulated as waters of the United States and are protected under the Clean Water Act. In Lake County, IL, additional protection is provided for “Isolated Wetlands of Lake County” through the Lake County Watershed Development Ordinance.

Riparian areas are vegetated ecosystems along a waterbody through which energy, materials, and water pass. Riparian areas are characterized by a high water table, are subject to periodic flooding. Riparian areas encompass wetlands, uplands, or some combination of the two. They will not always have all the characteristics necessary for them to be classified as wetlands.

Those riparian areas falling outside wetland boundaries may provide many of the same important water quality functions that wetlands provide. In addition, upland buffers play a valuable role in protecting sensitive wetlands or riparian areas from excessive nonpoint source pollution impacts by removing pollutants from inflowing waters.

Vegetated treatment systems (VTS) include vegetated filter strips and constructed wetlands. Vegetated filter strips (VFS) are vegetated areas designed and constructed to remove sediment and other pollutants from surface water runoff by filtration, deposition, infiltration, adsorption, absorption, decomposition, and volatilization. A vegetated filter strip maintains soil aeration (in contrast to wetlands that, at times, have anaerobic soil conditions). . Constructed wetlands are designed to simulate natural wetlands for the purposes of water purification or other functions. Constructed wetlands consist of former upland environments that have been modified to create poorly drained soils and wetland areas for pollutant removal from wastewaters or runoff. Constructed wetlands are essentially wastewater treatment systems and are designed and operated as such.

In areas where naturally occurring wetlands or riparian areas do not exist, VTS can be designed and constructed to perform some of the same functions. When such engineered systems are installed for a specific purpose, such as pollutant removal or flood control, they may not offer the same range of functions that naturally occurring wetlands or riparian areas offer.

Since the development of this management measure, vegetated green infrastructure has expanded to include a range of bioinfiltration installations ranging from tree infiltration boxes to VTS to rain gardens

to bioswales to constructed wetlands, all of which are increasingly promoted and implemented as alternatives to expanding gray infrastructure and improving water quality.

7.2. Wetlands in the Illinois Coastal Zone

Significant effort has been spent classifying and mapping wetlands and riparian areas in the coastal zone (Figure 7-1, Table 7-1). Fifty-four percent of wetlands and riparian acreage in the Illinois coastal zone is in protected status, i.e. owned by a park district, forest preserve, IDNR, etc.(Figure 7-2, Table 7-2).

Table 7-1 Wetland Acreage in the Coastal Zone

Status	Acreage
Protected Wetlands	5785.3
Unprotected Wetlands	4933.6
Total Wetlands	10718.9

Table 7-2 Breakdown of Protected Wetlands by Owner

Owner	Acreage
Forest Preserves	957.8
IDNR	3395.5
Openlands Lakeshore Preserve	8.7
Park Districts	563.2
Port District	860.1

7.3 Management Measures for Wetlands

This section addresses management measures to protect and restore Illinois' coastal wetlands and riparian areas. Management measures are economically achievable measures to control pollution of coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives (USEPA 1993). This section includes three management measures organized in the manner presented in USEPA's guidance documents:

1. Protection of Wetlands and Riparian Areas
2. Restoration of Wetlands and Riparian Areas
3. Vegetated Treatment Systems

7.3.1 Management Measure for Protection of Wetlands and Riparian Areas

The purpose of this management measure is to protect the water quality improvement functions of wetlands and riparian areas as a component of nonpoint source control programs. These practices maintain the functions of wetlands and riparian areas and prevent adverse impacts to areas serving a pollution abatement function. This management measure is intended to protect ecosystem and water quality functions of wetlands and riparian areas serving pollution abatement functions.

The nonpoint source pollution abatement functions performed by wetlands and riparian areas are most effective as parts of an integrated land management system that combines nutrient, sediment, and soil erosion control. Wetlands and riparian areas are effective in removing suspended solids, nutrients, and other contaminants from upland runoff. In addition, wetlands and riparian vegetation act as nutrient and carbon sinks. The processes that occur in these areas include sedimentation, microbial and chemical decomposition, organic export, filtration, adsorption, biological assimilation, and nutrient release.

USEPA guidance recommends that practices meeting the following criteria be in place in order to satisfy this management measure:

- Consider wetlands and riparian areas and their NPS control potential on a watershed or landscape scale
- Identify existing functions of those wetlands and riparian areas with significant NPS control potential when implementing NPS management practices. Do not alter wetlands or riparian areas to improve their water quality function at the expense of their other functions.
- Conduct permitting, licensing, certification, and nonregulatory NPS pollution abatement activities in a manner that protects wetland functions.

Applicability

The Illinois CNPCP addresses this management measure. This management measure, nationwide, is intended to be applied to protect wetlands and riparian areas from adverse NPS pollution impacts.

Existing Programs or Practices

Programs and activities that are being implemented for this management measure are described below.

Regulatory

The **Joint Permit application process**, administered in a partnership of the Chicago District of USACE, IEPA, and the IDNR, regulates the discharge of dredged or fill material into waters of the United States, including wetlands, per 33 CFR 323 (Federal Water Pollution Control (Clean Water) Act Section 404 - "Dredge and Fill"). This process mandates an evaluation of all potential impacts and requires that projects be designed to avoid, minimize and mitigate impacts.

Water quality certification for projects under the **Joint Permit process** is provided by the IEPA. The USACE cannot issue a permit without water quality certification from the IEPA.

(<http://www.gpo.gov/fdsys/pkg/CFR-2012-title33-vol3/pdf/CFR-2012-title33-vol3-part323.pdf>). **Section 401** of the Clean Water Act requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. Projects within wetlands or within the regulatory floodway of rivers, lakes and streams which are not covered under an existing Section 404 permit are required to provide an anti-degradation report which 1) assesses alternatives to the proposed project which will result in reduced pollutant load 2) includes a mitigation plan for unavoidable environmental degradation, 3) identifies and characterizes the current physical, biological and chemical conditions of the waterbody impacted by the proposed project, 4) quantifies the potential increase in pollutant load and potential impacts of the proposed project. IEPA has the option to waive the **Section 401 certification**, grant the permit, grant the permit with conditions, or deny the permit. The IEPA may require monitoring or mitigation as a condition for certification (<http://www.epw.senate.gov/water.pdf>).

The **Rivers and Harbors Act of 1899** prohibits any unauthorized obstruction or alteration of any navigable water of the United States. This includes structures in or over a navigable waterway or excavation from or deposition of material into a navigable water affecting the course, location, condition, or capacity of such waters. Fish and wildlife conservation, pollution, aesthetics, ecology and general welfare are taken into consideration in the permit review process. A Section 10 Permit is issued by the US Army Corps of Engineers, provide favorable reviews and certification by IDNR and IEPA. Common permitted activities include shoreline protection, construction of marinas, construction of bulkheads, dredging, beach nourishment, private docks and overhead powerlines (<http://www.gpo.gov/fdsys/pkg/USCODE-2011-title33/pdf/USCODE-2011-title33-chap9-subchapl-sec403.pdf>). Permits issued under Sections 9 and 10 of the Rivers and Harbors Act also require Water Quality Certification. It is required that the proposed activity be conducted in manner that does not violate water quality standards.

Illinois' Rivers, Lakes, and Streams Act (615 ILCS 5: Regulation of Public Waters, encoded at 17 IAC 3704) regulates projects in or along Lake Michigan or which are not within a regulatory floodway. The purposes of this Part include regulating construction to prevent the impairment of the rights, interests, or uses of any public body of water or in the natural resources thereof. The routine maintenance of existing structures is exempt. Permits are required. If a proposed project is determined to likely cause an impairment to the natural resources in any public body of water or will cause bank or shoreline instability on other properties, the applicant is required to provide a discussion of the measures that will be included in the project design to minimize or mitigate the negative impacts and an analysis of the extent and permanence of the activity's encroachment on the body of water and of any impairment the activity would have on the rights, interests or uses of the public in the body of water and in the natural resources thereof. The analysis shall consider both the activity alone and the combined effects of similar activities which exist and/or could be lawfully undertaken in the locality. No activity which would result in bank or shoreline instability on other properties will be permitted. Consequences of violation of this Part, including unauthorized activity or permit violations will be sought as determined by the IDNR to be

necessary and appropriate and may include requiring the removal of the structure, fill or deposit (<http://www.dnr.illinois.gov/adrules/documents/17-3704.pdf>).

Illinois Rivers, Lakes, and Streams Act (615 ILCS 5: Floodway Construction in Northeastern Illinois, encoded at 17 IAC 3708) regulates construction and filling in the regulatory floodway of rivers, lakes and streams in northeastern Illinois. Regional Permit No. 3 “Authorizing Construction of Minor Projects in Northeastern Illinois Regulatory Floodways” is in effect which authorizes certain types of shoreline and streambank protection with limits on the size of shoreline and streambank protection efforts, limits on the types of materials used and their placement, requirements that the disturbance of vegetation shall be kept to a minimum during construction to minimize erosion and sedimentation, and requirements that disturbed areas be seeded or stabilized upon completion of construction. This protects wetlands and riparian zones from unnecessary disturbance. Projects within Illinois Coastal Zone waterways, floodplains or wetlands which do not meet the requirements to fall under the regional permit are required to apply for a Joint Permit. The Joint Permit application requires detailed information about fill material which will be discharged into waterways and a description of avoidance, minimization and compensatory activities. This information is available to IDNR OWR staff during their portion of the permit review process (<http://www.dnr.illinois.gov/adrules/documents/17-3708.pdf>).

Lake County Stormwater Management Commission (SMC) has delegated authority under 615 ILCS 5, Section 5-1062 from IDNR OWR to issue **permits for development in regulatory floodplain and floodway** through an agreement with the Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR). IDNR/OWR retains regulatory authority over all developments that impact Public Bodies of Water, development in streams with over 1-square mile of drainage area and without a regulatory floodway, and in those cases where detailed studies or the proposed development have changed the regulatory floodway boundary. LCSMC is the primary contact to determine if LCSMC or IDNR/OWR will be the regulatory authority (http://www.lakecountyil.gov/Stormwater/Documents/Regulatory/TRM/DrftTRM_Sec2.pdf).

The **Interagency Wetland Policy Act of 1989** (20 ILCS 830) directs that, where possible, state agencies should “preserve, enhance, and create wetlands.” It also sets a goal of zero net loss of existing wetlands, or their value, from State supported activities. It accomplishes this by requiring State agencies to make wetland preservation a priority in all of their construction and land management plans. Where there is no feasible alternative to wetland degradation, that loss must be offset through the implementation of a Wetland Compensation Plan. This act creates an Interagency Wetlands Committee including IDNR, IEPA, Illinois Department of Agriculture, Illinois Department of Transportation, Illinois Historic Preservation Agency, Illinois Department of Commerce and Economic Opportunity, and the Capitol Development Board. The goal of the act is to ensure no net loss in wetlands due to state-supported activities, through the development of agency action plans and establishing a mitigation policy (<http://www.dnr.illinois.gov/adrules/documents/17-1090.pdf> (https://dnr.state.il.us/wetlands/iwc_intro.htm and <https://dnr.state.il.us/wetlands/ch6e.htm>)).

The **Comprehensive Environmental Review Process (CERP)** is an internal IDNR process to review 1) actions that the department performs or funds, 2) actions that the Department approves and tax incentive is provided, or 3) actions that occur on IDNR-owned or leased land. An action is any activity that may change the existing physical, chemical, or biological conditions of the air, land, or water. Channelization activities which fit any of the three criteria above are reviewed for potential impact on threatened or endangered species, high value natural areas, wetlands, cultural resources, and other resources such as migratory birds, fisheries, forests, prairies, streams, and riparian corridors. Actions that may cause significant alterations to lakes or streams require a public review period. Certain activities such as controlling nuisance aquatic vegetation; transplanting native aquatic or semi-aquatic plants to establish cover, increase habitat diversity and prevent erosion; and maintaining existing levees and water control structures are exempt from review under most circumstances. <http://dnr.state.il.us/orep/docs/CERPmanual.pdf>

The **Cook County Watershed Management Ordinance** (55 ILCS §5/5-1062.1; 70 ILCS 2605/1 *et. seq.*) is administered to abate the negative impacts of stormwater runoff (e.g. flooding, erosion, water quality impairments, etc.) from developments or redevelopments. One of the goals of the ordinance is to protect existing water resources including lakes, streams, floodplains, wetlands and ground water from detrimental and unnecessary modification in order to maintain their beneficial functions. Permits are required for development activities with potential wetland or riparian environment impacts. Article 6 of the Ordinance mandates special protections for floodplains, wetlands, wetland buffers, and riparian areas. The Ordinance requires that development in floodplains cannot increase flood elevations or decrease conveyance capacity on other property. Developments also cannot increase flood velocity, impair hydrologic function, or degrade water quality. Article 6 has several elements that protect wetland and riparian areas, both of which attenuate the impacts of flooding and erosion. The Ordinance requires that developers must provide the District with the boundaries, extent, function, value, and quality of all wetlands and riparian environments on site. Development that impacts wetlands is discouraged by the WMO, but mitigation is allowed in some cases. The WMO encourages existing riparian functions to be protected. Mitigation practices may include restoration of degraded wetlands or riparian areas. And as such this program supports the requirements of this management measure. The requirements mandated by Article 5 (erosion and sediment controls) and Article 6 (protection of floodplains, wetlands, wetland buffers, and riparian areas) meet the requirements of this management measure.

(https://www.mwrd.org/pv_obj_cache/pv_obj_id_4985C2CD4FAB1ABFC7726C7E8F2A7E3E199B7200/filename/WMO.pdf)

The **Lake County Watershed Development Ordinance** (55 ILCS §5.5-1062) is administered to prevent flood damages to life and property, to assure that development does not increase flood and drainage hazards to others, or create unstable conditions susceptible to erosion, to conserve the natural hydrologic, hydraulic, water quality and other beneficial functions of flood-prone areas and wetlands in Lake County. This Ordinance generally requires a Watershed Development Permit for developments in floodplains, wetlands, or depressional storage areas. Section B of Article 4 of Lake County's Ordinance

pertains to all Watershed Development Permits and includes mandates protecting stream channels, overland flows of stormwater, and water quality treatment areas. If natural channels are proposed for modification, a mitigation plan is required that demonstrates conservation of the physical characteristics of the existing channel, including length, cross-section, slope, sinuosity and carrying capacity. Revegetation is required using native plants. Section C of Article 4 of the Ordinance regulates activities in floodplains by restricting modification and disturbance of natural riverine floodplains to protect existing hydrologic and environmental functions. It requires disturbances shall be minimized and negative impacts mitigated. No developments are permitted that alone or cumulatively create a damaging or potentially damaging increase in flood levels. Section E of Article 4 of the Ordinance regulates activities in jurisdictional and non-jurisdictional wetlands. Delineations, impact assessments, alternatives analyses, and mitigation plans are required. Further, mitigation is required to provide for replacement of lost wetland at rates proportional to the quality of the impacted wetlands, with 6-to-1 mitigation ratio required for impacting forested wetlands. Buffer areas for mitigation wetlands are required, and, mitigation is not allowed within detention facilities. These and other requirements mandated by the Lake County Watershed Development Ordinance meet the requirements of this management measure.

(<http://www.lakecountyil.gov/stormwater/floodplainstormwaterregulations/wdoandtrm/Pages/watersheddevelopmentordinance.aspx>)

Education, Public Outreach and Technical and Financial Assistance

The **Chicago Wilderness Green Infrastructure Vision** (<http://www.cmap.illinois.gov/livability/open-space/green-infrastructure-vision>) considers the value of wetlands, riparian corridors, and other natural areas on a landscape scale. IDNR has been heavily involved in the development of this vision, which relies on geospatial data to inform regional land-use planning through the identification of connections between open space areas. Most of the long-distance connections follow riparian corridors.

GO TO 2040 is a regional strategic plan which covers all municipalities within the Illinois Coastal Zone. It was created by Chicago Metropolitan Agency for Planning, a unit of government which is the regional planning agency for northeastern Illinois. This plan is currently being implemented at the local level. High quality natural areas, including wetlands, are called out in the plan for protection for their role in the environment and the ecosystem services they provide on a local and regional scale (<http://www.cmap.illinois.gov/about/2040/livable-communities/open-space>).

The **Illinois Urban Manual** was originally developed by the IEPA and is currently hosted and continually updated by the Association of Illinois Soil and Water Conservation Districts through funding from Section 319 of the Clean Water Act. This manual is the go-to technical reference on best management practices for soil erosion and sediment control, stormwater management, and special area protection. It is used by developers, planners, engineers, government officials and others involved in land use planning, building site development, and natural resource conservation in rural and urban communities and

developing areas, including the Illinois Coastal Zone. The manual has guidance on best management practice selection, construction specifications, material specifications, and provides standard drawings. The manual includes a thorough discussion of wetland enhancement best management practices (See IUM practices standards 997 through 999, <http://www.aiswcd.org/ium/practice-standards/>) which can be applied to meet the goal of balancing the balancing improvements to wetland water quality functions with their other functions such as providing wildlife habitat. (<http://www.aiswcd.org/ium/>).

The **Cook County Technical Guidance Manual**, created by MWRD, is a companion to the Cook County WMO. It intended to provide information required in support of a Watershed Management Permit, provide guidance to best achieve the WMO's requirement and provide examples to meet the requirements of the WMO. It builds upon the guidance provided in the Illinois Urban Manual. (https://www.mwrdrd.org/iri/go/km/docs/documents/MWRD/internet/protecting_the_environment/Stormwater_Management/Pdfs/WMO/TGM/TGM.pdf). Likewise, the **Lake County Technical Reference Manual** is a companion to the Lake County WDO. It is intended to assist applicants who are seeking to comply with the WDO. It includes technical background and reference information, direction to assist in uniform and comprehensive permit applications, design guidelines, information as a useful resource for planning purposes, and interpretation for the WDO. Both of these manuals provide detailed information on best management practices and requirements, including practices which can be applied to meet the goal of balancing the balancing improvements to wetland water quality functions with their other functions such as providing wildlife habitat.

IDNR has several land acquisition programs which can be used for acquisition and protection of wetlands. The **Park and Recreational Facility Construction Grant Program (PARC)**, Public Act 096-0820, provides grants to units of local government to acquire land to protect floodplains, wetlands, natural areas, wildlife habitat, and unique geologic and biologic features. (<https://dnr.state.il.us/ocd/newparc1.htm>). Additionally, IDNR manages the **Open Space Lands Acquisition and Development Program** and the **Land and Water Conservation Fund** grant programs which operate under a joint application process and provide grants to units of local government to acquire new openspace land for recreation and natural resource preservation. (<https://dnr.state.il.us/ocd/newoslad1.htm>). The IDNR Office of Resource Conservation's Division of Wildlife Resources administers four special grant programs, collectively known as **IDNR Special Wildlife Funds Grants** that are funded by Illinois sportsmen through the purchase of Habitat Stamps and Migratory Waterfowl Stamps. Eligible projects include those seeking to preserve, protect, acquire or manage habitat (i.e. wetlands, woodlands, grasslands, and agricultural lands, natural or altered) in Illinois that have the potential to support populations of wildlife in any or all phases of their life cycles. (https://dnr.state.il.us/grants/special_funds/wildgrant.htm). IDNR has a **Natural Areas Acquisition Fund** which provides funding for the agency's purchase, protection and stewardship of high quality natural areas including wetlands (<https://dnr.state.il.us/wetlands/CH5D.HTM>).

"Acres for Wildlife" is an IDNR Landowner Assistance Program. Through "Acres for Wildlife," landowners receive help in protecting, improving, or developing lasting wildlife habitat on their property. Key provisions include: the program is strictly voluntary, landowners retain complete property

control (trespass for any reason is prohibited without landowner permission), there is no cost for IDNR services (or payments for participation). In return for IDNR assistance, landowners pledge their willingness to protect and improve habitat on their land as they are able. Protecting a minimum of one acre of habitat for at least one year is required. Landowners, including riparian land owners, will receive a management plan which may suggest changes to land management including the use of prescribed fire, the control of invasive species, etc. Free native plant seeds or plugs may be provided, and biologists advise land owners on available funding. <https://dnr.state.il.us/orc/Wildliferesources/AFW/>

The **Forest Preserves of Cook County**, with more than 68,000-acres, is the largest forest preserve district in the United States. Its mission is to acquire, restore and manage lands for the purpose of protecting and preserving public open space. Special ecosystems worthy of preservation, including wetlands and riparian corridors, are targeted for acquisition, protection and management. **Lake County Forest Preserves**, with more than 30,000 acres, has a parallel mission in Lake County, IL. **Local park districts**, such as the Chicago Park District, also have funding to acquire, protect and manage wetlands and riparian corridors.

The **Agricultural Conservation Easement Program** (ACEP) is administered through the US Department of Agriculture's Natural Resources Conservation Service. Under the Wetland Reserve Easements component of the program, private property owners with wetlands on their properties may enroll in the program to put in place conservation easements and receive cost-share for restoration costs (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/>).

The **National Coastal Wetlands Conservation Grant Program** was established by P.L. 101-646, Coastal Wetlands Planning, Protection and Restoration Act of 1990 authorizing the U.S. Fish and Wildlife Service to provide matching grants to States for acquisition, restoration, management or enhancement of coastal wetlands.

Established by the Illinois Natural Areas Preservation Act (525 ILCS 30/), the **Illinois Nature Preserves Commission** (INPC) promotes the preservation of significant lands and oversees their stewardship, management, and protection by offering various land protection options designed to assist landowners who wish to voluntarily preserve their land (<http://dnr.state.il.us/inpc/Index.htm>). Several programs are available for landowners with properties with high-quality natural communities or other significant natural and/or archeological features. The INPC operates within the IDNR. <http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1739&ChapterID=44>

In summary, the criteria for the Wetland and Riparian Area Protection Management Measure are effectively implemented through these primary regulatory and non-regulatory programs:

1. State environmental reviews that are triggered by developers requiring federal permits for any development that has the potential to discharge pollutants to waters, including wetlands, of the US,

2. Lake and Cook County ordinances that require stringent alternatives analysis to avoid adverse impacts to riparian areas and wetlands, and mitigation measures for unavoidable impacts, and,
3. National, state and local agencies have made a number of programs for acquisition, protection and management of wetlands and riparian areas.

All programs used to implement this measure are listed in Table 7-3. This table summarizes the programs; authorizing legislation; program authority; lead agency enforcement mechanisms; and evaluation methods.

Enforcement Mechanisms

The USEPA and USACE are under a memorandum of agreement (MOA) on enforcement of Section 404. Under the MOA, the USACE, as the federal Agency that issues the permits, has the lead on permit violation cases. For unpermitted discharges, USEPA and USACE determine the appropriate lead agency based upon the criteria of the MOA. Enforcement tools include administrative compliance orders requiring a violator to stop any ongoing illegal discharge, civil penalties, and civil judicial enforcement. USEPA and USACE reserve their criminal enforcement authority for only the most flagrant and egregious Section 404 violations. Section 10 violators are issued a cease and desist order, violations are investigated, and administrative or legal action may be taken. Remedial measures can be ordered, and state agencies, including IEPA, can be involved in the decision on appropriate actions.

The IEPA is responsible for the review of Joint Permit applications and issuance of 401 Water Quality Certifications, as appropriate. If the IEPA determines that a discharge subject to a 401 Water Quality Certification will affect the quality of its waters so as to violate any water quality standards in Illinois, the IEPA has the authority to impose conditions or refuse to issue a license or permit. The IEPA, through the 401 Water Quality Certification process, has the authority to file lawsuits against violators of the Rivers and Harbors Act of 1899. IEPA has the authority to assess civil penalties for violations of NPDES requirements and performance standards and for ensuring compliance of MS4 permit holders with their general permit. IEPA is also responsible for the enforcement of NPDES rules for construction activities regulated under 40 CFR 122.26. With respect to enforcement, Section 31 of the Clean Water Act sets the basic framework for environmental compliance assurance and enforcement (415 ILCS §5/31). IEPA can assess civil penalties for violations of NPDES requirements or state water quality standards. 415 ILCS §5/42. In addition to the above, IEPA has the authority to issue citations or initiate enforcement actions for documented violations of the State Water Quality Standards (35 IAC 302). State water quality standards also apply to sites smaller than one acre regardless of whether or not they are required to have an NPDES permit.

The Rivers, Lakes, and Streams Act and Illinois Rivers and Harbors Act give the IDNR jurisdiction over all waterbodies in the State, navigable and non-navigable and authorize the Agency to ascertain to what extent, if at all, these waters and shorelines have been or are proposed to be encroached upon by private interests or individuals. The Act gives IDNR authority to either recover full compensation for wrongful encroachment, or to recover the use of the same. The IDNR OWR is responsible for the review

of Joint Permit applications and has enforcement authorities. Under the Rivers, Lakes, and Streams Act, illegal discharge is punishable as a Class A misdemeanor (615 ILCS §5/18). OWR has the authority to issue permits for construction in floodplains and floodways and has related enforcement authority.

IDNR also has authority to conduct a comprehensive review on actions funded or performed by IDNR for environmental and historical impacts. Projects expected to have negative impacts on wetlands can be halted until the project proponent agrees to modifications to minimize or mitigate impacts. IDNR has the power to enforce the laws of the State and the rules and regulations of the Department in or on any lands owned, leased, or managed by the Department (20 ILCS §805/805-515).

Wetlands that are designated Nature Preserves are protected by the Illinois Nature Preserves Commission. The Commission and IDNR implement the Natural Areas Preservation act, which allows for consultation and review of projects that can impact high quality natural areas.

MWRD has the authority and the responsibility for administering the Cook County Watershed Management Ordinance. This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit.

LCSMC has the authority and the responsibility for administering the Lake County Watershed Development Ordinance (WDO). This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit. Legal action may be taken and a notice of the violation may be recorded to the title to the property. LCSMC is available to meet with communities to provide technical assistance on WDO related issues at any time. LCSMC also has delegated authority from the OWR for enforcement of Part 3708 of the Rivers, Lakes and Streams Act (17 IAC 3708).

7.3.2 Management Measure for Restoration of Wetlands and Riparian Areas

This management measure is applied to restore the full range of wetlands and riparian functions in areas where the systems have been degraded and destroyed and where they can serve a significant nonpoint source abatement function. Restoration of wetlands and riparian areas involves the recovery of a range of functions that formerly existed, by reestablishing the hydrology, vegetation, and structure characteristics. A restoration management measure should be used in conjunction with other management measures addressing the adjacent land use activities.

This management measure generally will be implemented by applying one or more appropriate management practices. Practices that have been found by USEPA to be representative of the types of practices that can be applied successfully to achieve the management measure's objectives are:

- Provide a hydrologic regime similar to that of the type of wetland or riparian area being restored
- Restore native plant species through either natural succession or selected planting
- Plan restoration as part of naturally occurring aquatic ecosystems

Applicability

The Illinois CNPCP addresses this management measure. This management measure, nationwide, is intended to be applied by states to restore the full range of wetlands and riparian functions in areas where the systems have been degraded and destroyed and where they can serve a significant NPS abatement function.

Existing Programs or Practices

Following is a list of programs and activities that are being implemented for this management measure.

Regulatory

The **Joint Permit application process**, administered in a partnership of the Chicago District of USACE, IEPA, and the IDNR, regulates the discharge of dredged or fill material into waters of the United States, including wetlands, per 33 CFR 323 (Federal Water Pollution Control (Clean Water) Act Section 404 - "Dredge and Fill"). This process mandates an evaluation of all potential impacts and requires that projects be designed to avoid, minimize and mitigate impacts.

Water quality certification for projects under the **Joint Permit process** is provided by the IEPA. The USACE cannot issue a permit without water quality certification from the IEPA. (<http://www.gpo.gov/fdsys/pkg/CFR-2012-title33-vol3/pdf/CFR-2012-title33-vol3-part323.pdf>). **Section 401** of the Clean Water Act requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. Projects within wetlands or within the regulatory floodway of rivers, lakes and streams which are not covered under an existing Section 404 permit are required to provide an anti-degradation report which 1) assesses alternatives to the proposed project which will result in reduced pollutant load 2) includes a mitigation plan for unavoidable environmental degradation, 3) identifies and characterizes the current physical, biological and chemical conditions of the waterbody impacted by the proposed project, 4) quantifies the potential increase in pollutant load and potential impacts of the proposed project. IEPA has the option to waive the **Section 401 certification**, grant the permit, grant the permit with conditions, or deny the permit. The IEPA may require monitoring or mitigation as a condition for certification (<http://www.epw.senate.gov/water.pdf>).

The **Rivers and Harbors Act of 1899** prohibits any unauthorized obstruction or alteration of any navigable water of the United States. This includes structures in or over a navigable waterway or excavation from or deposition of material into a navigable water affecting the course, location, condition, or capacity of such waters. Fish and wildlife conservation, pollution, aesthetics, ecology and general welfare are taken into consideration in the permit review process. A Section 10 Permit is issued by the US Army Corps of Engineers, provide favorable reviews and certification by IDNR and IEPA. Common permitted activities include shoreline protection, construction of marinas, construction of bulkheads, dredging, beach nourishment, private docks and overhead powerlines (<http://www.gpo.gov/fdsys/pkg/USCODE-2011-title33/pdf/USCODE-2011-title33-chap9-subchapl->

[sec403.pdf](#)). Permits issued under Sections 9 and 10 of the Rivers and Harbors Act also require Water Quality Certification. It is required that the proposed activity be conducted in manner that does not violate water quality standards.

Illinois' Rivers, Lakes, and Streams Act (615 ILCS 5: Regulation of Public Waters, encoded at 17 IAC 3704) regulates projects in or along Lake Michigan or which are not within a regulatory floodway. The purposes of this Part include regulating construction to prevent the impairment of the rights, interests, or uses of any public body of water or in the natural resources thereof. The routine maintenance of existing structures is exempt. Permits are required. If a proposed project is determined to likely cause an impairment to the natural resources in any public body of water or will cause bank or shoreline instability on other properties, the applicant is required to provide a discussion of the measures that will be included in the project design to minimize or mitigate the negative impacts and an analysis of the extent and permanence of the activity's encroachment on the body of water and of any impairment the activity would have on the rights, interests or uses of the public in the body of water and in the natural resources thereof. The analysis shall consider both the activity alone and the combined effects of similar activities which exist and/or could be lawfully undertaken in the locality. No activity which would result in bank or shoreline instability on other properties will be permitted. Consequences of violation of this Part, including unauthorized activity or permit violations will be sought as determined by the IDNR to be necessary and appropriate and may include requiring the removal of the structure, fill or deposit (<http://www.dnr.illinois.gov/adrules/documents/17-3704.pdf>).

Illinois' Rivers, Lakes, and Streams Act (615 ILCS 5: Floodway Construction in Northeastern Illinois, encoded at 17 IAC 3708) regulates construction and filling in the regulatory floodway of rivers, lakes and streams in northeastern Illinois. Regional Permit No. 3 "Authorizing Construction of Minor Projects in Northeastern Illinois Regulatory Floodways" is in effect which authorizes certain types of shoreline and streambank protection with limits on the size of shoreline and streambank protection efforts, limits on the types of materials used and their placement, requirements that the disturbance of vegetation shall be kept to a minimum during construction to minimize erosion and sedimentation, and requirements that disturbed areas be seeded or stabilized upon completion of construction. Projects within Illinois Coastal Zone waterways, floodplains or wetlands which do not meet the requirements to fall under the regional permit are required to apply for a Joint Permit. The Joint Permit application requires detailed information about fill material which will be discharged into waterways and a description of avoidance, minimization and compensatory activities. This information is available to IDNR OWR staff during their portion of the permit review process (<http://www.dnr.illinois.gov/adrules/documents/17-3708.pdf>).

Lake County Stormwater Management Commission (SMC) has delegated authority under 615 ILCS 5, Section 5-1062 from IDNR OWR to issue **permits for development in regulatory floodplain and floodway** through an agreement with the Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR). IDNR/OWR retains regulatory authority over all developments that impact Public Bodies of Water, development in streams with over 1-square mile of drainage area and without a regulatory floodway, and in those cases where detailed studies or the proposed development have

changed the regulatory floodway boundary. LCSMC is the primary contact to determine if LCSMC or IDNR/OWR will be the regulatory authority

(http://www.lakecountyil.gov/Stormwater/Documents/Regulatory/TRM/DrftTRM_Sec2.pdf).

The **Interagency Wetland Policy Act of 1989** (20 ILCS 830) directs that, where possible, state agencies should “preserve, enhance, and create wetlands.” It also sets a goal of zero net loss of existing wetlands, or their value, from State supported activities. It accomplishes this by requiring State agencies to make wetland preservation a priority in all of their construction and land management plans. Where there is no feasible alternative to wetland degradation, that loss must be offset through the implementation of a Wetland Compensation Plan. This act creates an Interagency Wetlands Committee including IDNR, IEPA, Illinois Department of Agriculture, Illinois Department of Transportation, Illinois Historic Preservation Agency, Illinois Department of Commerce and Economic Opportunity, and the Capitol Development Board. The goal of the act is to ensure no net loss in wetlands due to state-supported activities, through the development of agency action plans and establishing a mitigation policy

<http://www.dnr.illinois.gov/adrules/documents/17-1090.pdf>

(https://dnr.state.il.us/wetlands/iwc_intro.htm and <https://dnr.state.il.us/wetlands/ch6e.htm>).

The **Comprehensive Environmental Review Process (CERP)** is an internal IDNR process to review 1) actions that the department performs or funds, 2) actions that the Department approves and tax incentive is provided, or 3) actions that occur on IDNR-owned or leased land. An action is any activity that may change the existing physical, chemical, or biological conditions of the air, land, or water. Channelization activities which fit any of the three criteria above are reviewed for potential impact on threatened or endangered species, high value natural areas, wetlands, cultural resources, and other resources such as migratory birds, fisheries, forests, prairies, streams, and riparian corridors. Actions that may cause significant alterations to lakes or streams require a public review period. Certain activities such as controlling nuisance aquatic vegetation; transplanting native aquatic or semi-aquatic plants to establish cover, increase habitat diversity and prevent erosion; and maintaining existing levees and water control structures are exempt from review under most circumstances. (<http://dnr.state.il.us/orep/docs/CERPmanual.pdf>)

The **Cook County Watershed Management Ordinance** (55 ILCS §5/5-1062.1; 70 ILCS 2605/1 *et. seq.*) is administered to abate the negative impacts of stormwater runoff (e.g. flooding, erosion, water quality impairments, etc.) from developments or redevelopments. One of the goals of the ordinance is to protect existing water resources including lakes, streams, floodplains, wetlands and ground water from detrimental and unnecessary modification in order to maintain their beneficial functions. Permits are required for development activities with potential wetland or riparian environment impacts. Article 6 of the Ordinance mandates special protections for floodplains, wetlands, wetland buffers, and riparian areas. The Ordinance requires that development in floodplains cannot increase flood elevations or decrease conveyance capacity on other property. Developments also cannot increase flood velocity, impair hydrologic function, or degrade water quality. Article 6 has several elements that protect wetland and riparian areas, both of which attenuate the impacts of flooding and erosion. The Ordinance requires that developers must provide the District with the boundaries, extent, function, value, and

quality of all wetlands and riparian environments on site. Development that impacts wetlands is discouraged by the WMO, but mitigation is allowed in some cases. The WMO encourages existing riparian functions to be protected. Mitigation practices may include restoration of degraded wetlands or riparian areas. And as such this program supports the requirements of this management measure. The requirements mandated by Article 5 (erosion and sediment controls) and Article 6 (protection of floodplains, wetlands, wetland buffers, and riparian areas) meet the requirements of this management measure.

(https://www.mwrd.org/pv_obj_cache/pv_obj_id_4985C2CD4FAB1ABFC7726C7E8F2A7E3E199B7200/filename/WMO.pdf)

The **Lake County Watershed Development Ordinance** (55 ILCS §5.5-1062) is administered to prevent flood damages to life and property, to assure that development does not increase flood and drainage hazards to others, or create unstable conditions susceptible to erosion, to conserve the natural hydrologic, hydraulic, water quality and other beneficial functions of flood-prone areas and wetlands in Lake County. This Ordinance generally requires a Watershed Development Permit for developments in floodplains, wetlands, or depressional storage areas. Section B of Article 4 of Lake County's Ordinance pertains to all Watershed Development Permits and includes mandates protecting stream channels, overland flows of stormwater, and water quality treatment areas. If natural channels are proposed for modification, a mitigation plan is required that demonstrates conservation of the physical characteristics of the existing channel, including length, cross-section, slope, sinuosity and carrying capacity. Revegetation is required using native plants. Section C of Article 4 of the Ordinance regulates activities in floodplains by restricting modification and disturbance of natural riverine floodplains to protect existing hydrologic and environmental functions. It requires disturbances shall be minimized and negative impacts mitigated. No developments are permitted that alone or cumulatively create a damaging or potentially damaging increase in flood levels. Section E of Article 4 of the Ordinance regulates activities in jurisdictional and non-jurisdictional wetlands. Delineations, impact assessments, alternatives analyses, and mitigation plans are required. Further, mitigation is required to provide for replacement of lost wetland at rates proportional to the quality of the impacted wetlands, with 6-to-1 mitigation ratio required for impacting forested wetlands. Buffer areas for mitigation wetlands are required, and, mitigation is not allowed within detention facilities. Mitigation may include restoration of degraded wetlands or riparian areas. And as such this program supports the requirements of this management measure.

<http://www.lakecountyil.gov/stormwater/floodplainstormwaterregulations/wdoandtrm/Pages/watersheddevelopmentordinance.aspx>

Education, Public Outreach and Technical and Financial Assistance

The **Illinois Urban Manual** (<http://www.aiswcd.org/ium/>) was originally developed by the IEPA and is currently hosted and continually updated by the Association of Illinois Soil and Water Conservation Districts through funding from Section 319 of the Clean Water Act. This manual is the go-to technical reference on best management practices for soil erosion and sediment control, stormwater

management, and special area protection. It is used by developers, planners, engineers, government officials and others involved in land use planning, building site development, and natural resource conservation in rural and urban communities and developing areas, including the Illinois Coastal Zone. The manual has guidance on best management practice selection, construction specifications, material specifications, and provides standard drawings. The manual includes a thorough discussion of wetland creation and restoration best management practices. Extensive technical information is available on how to create a hydrologic regime similar to the type of wetland being restored, successfully plant native species from local ecotypes to ensure species diversity and survival, and plan and conduct restoration so that the result will be equivalent to a naturally occurring wetland ecosystem. For example, the manual provides guidance on when to use seeds versus plugs, talks about options for restoring hydrology, and provides guidance on the wildlife habitat considerations in play when making decisions on water control structures (See IUM practices standards 997 through 999, <http://www.aiswcd.org/ium/practice-standards/>)

The **Cook County Technical Guidance Manual**, created by MWRD, is a companion to the Cook County WMO. It intended to provide information required in support of a Watershed Management Permit, provide guidance to best achieve the WMO's requirement and provide examples to meet the requirements of the WMO. It builds upon the guidance provided in the Illinois Urban Manual. (https://www.mwrdd.org/iri/go/km/docs/documents/MWRD/internet/protecting_the_environment/Stormwater_Management/Pdfs/WMO/TGM/TGM.pdf). Likewise, the **Lake County Technical Reference Manual** is a companion to the Lake County WDO. It is intended to assist applicants who are seeking to comply with the WDO. It includes technical background and reference information, direction to assist in uniform and comprehensive permit applications, design guidelines, information as a useful resource for planning purposes, and interpretation for the WDO. Both of these manuals provide detailed information on best management practices and requirements, including practices which can be applied to meet the goal of balancing the balancing improvements to wetland water quality functions with their other functions such as providing wildlife habitat.

The IDNR Office of Resource Conservation's Division of Wildlife Resources administers four special grant programs, collectively known as **IDNR Special Wildlife Funds Grants** that are funded by Illinois sportsmen through the purchase of Habitat Stamps and Migratory Waterfowl Stamps. Eligible projects include those seeking to preserve, protect, acquire or manage habitat (i.e. wetlands, woodlands, grasslands, and agricultural lands, natural or altered) in Illinois that have the potential to support populations of wildlife in any or all phases of their life cycles. These grants can be used for projects which restore native plant species (https://dnr.state.il.us/grants/special_funds/wildgrant.htm). IDNR has a **Natural Areas Acquisition Fund** which provides funding for the agency's purchase, protection, restoration and stewardship of high quality natural areas including wetlands (<https://dnr.state.il.us/wetlands/CH5D.HTM>).

"Acres for Wildlife" is an IDNR Landowner Assistance Program. Through "Acres for Wildlife," landowners receive help in protecting, improving, or developing lasting wildlife habitat on their property. Key provisions include: the program is strictly voluntary, landowners retain complete property

control (trespass for any reason is prohibited without landowner permission), there is no cost for IDNR services (or payments for participation). In return for IDNR assistance, landowners pledge their willingness to protect and improve habitat on their land as they are able. Protecting a minimum of one acre of habitat for at least one year is required. Landowners, including riparian land owners, will receive a management plan which may suggest changes to land management including the use of prescribed fire, the control of invasive species, etc. Free native plant seeds or plugs may be provided, and biologists advise land owners on available funding. <https://dnr.state.il.us/orc/Wildliferesources/AFW/>

The **Forest Preserves of Cook County**, with more than 68,000-acres, is the largest forest preserve district in the United States. Its mission is to acquire, restore and manage lands for the purpose of protecting and preserving public open space. Special ecosystems worthy of preservation, including wetlands and riparian corridors, are targeted for acquisition, protection and management. **Lake County Forest Preserves**, with more than 30,000 acres, has a parallel mission in Lake County, IL. **Local park districts**, such as the Chicago Park District, also have funding to acquire, protect and manage wetlands and riparian corridors.

The **Agricultural Conservation Easement Program** (ACEP) is administered through the US Department of Agriculture's Natural Resources Conservation Service. Under the Wetland Reserve Easements component of the program, private property owners with wetlands on their properties may enroll in a conservation easements and receive cost-share for restoration costs.

The **National Coastal Wetlands Conservation Grant Program** was established by P.L. 101-646, Coastal Wetlands Planning, Protection and Restoration Act of 1990 authorizing the U.S. Fish and Wildlife Service to provide matching grants to States for acquisition, restoration, management or enhancement of coastal wetlands.

Established by the Illinois Natural Areas Preservation Act (525 ILCS 30/), the **Illinois Nature Preserves Commission** (INPC) promotes the preservation of significant lands and oversees their stewardship, management, and protection by offering various land protection options designed to assist landowners who wish to voluntarily preserve their land (<http://dnr.state.il.us/inpc/Index.htm>). Several programs are available for landowners with properties with high-quality natural communities or other significant natural and/or archeological features. The INPC operates within the IDNR.

New in 2013, the **Chi-Cal Rivers Fund** is a private-public partnership which funds projects to enhance in stream habitat for aquatic life within the CAWS. IDNR is one of the major funders. Funded projects may include riverbank naturalization, bank stabilization, riparian buffer planting, in-stream structure installation, and restoration of wetlands, prairies, and forests adjacent to watercourses. www.nfwf.org/chi-cal

The **Illinois Wetland Restoration and Creation Guide** is a technical guide that was prepared by the Illinois Natural History Survey in 1997. It provides detailed information on how to plan wetland restoration and creation projects, with a strong focus on designing the hydraulic regime, selecting and

planting native vegetative species, and monitoring the ecosystem functions of the restored or created wetland.

(<http://www.dot.state.il.us/desenv/environmental/IllinoisWetlandRestorationAndCreationGuide.pdf>)

In summary, the criteria for the Wetland and Riparian Area Restoration Management Measure are effectively implemented through these primary regulatory and non-regulatory programs:

1. Lake and Cook County ordinances that require that adverse impacts to riparian areas and wetlands be mitigated. Mitigation may include restoration or enhancement of degraded wetlands and riparian areas, and,
2. National, state and local agencies have a number of programs for acquisition, restoration, and management of wetlands and riparian areas.

All programs used to implement this measure are listed in Table 7-3. This table summarizes the programs; authorizing legislation; program authority; lead agency enforcement mechanisms; and evaluation methods.

Enforcement Mechanisms

The USEPA and USACE are under a memorandum of agreement (MOA) on enforcement of Section 404. Under the MOA, the USACE, as the federal Agency that issues the permits, has the lead on permit violation cases. For unpermitted discharges, USEPA and USACE determine the appropriate lead agency based upon the criteria of the MOA. Enforcement tools include administrative compliance orders requiring a violator to stop any ongoing illegal discharge, civil penalties, and civil judicial enforcement. USEPA and USACE reserve their criminal enforcement authority for only the most flagrant and egregious Section 404 violations. Section 10 violators are issued a cease and desist order, violations are investigated, and administrative or legal action may be taken. Remedial measures can be ordered, and state agencies, including IEPA, can be involved in the decision on appropriate actions.

The IEPA is responsible for the review of Joint Permit applications and issuance of 401 Water Quality Certifications, as appropriate. If the IEPA determines that a discharge subject to a 401 Water Quality Certification will affect the quality of its waters so as to violate any water quality standards in Illinois, the IEPA has the authority to impose conditions or refuse to issue a license or permit. The IEPA, through the 401 Water Quality Certification process, has the authority to file lawsuits against violators of the Rivers and Harbors Act of 1899. IEPA has the authority to assess civil penalties for violations of NPDES requirements and performance standards and for ensuring compliance of MS4 permit holders with their general permit. IEPA is also responsible for the enforcement of NPDES rules for construction activities regulated under 40 CFR 122.26. With respect to enforcement, Section 31 of the Clean Water Act sets the basic framework for environmental compliance assurance and enforcement (415 ILCS §5/31). IEPA can assess civil penalties for violations of NPDES requirements or state water quality standards. 415 ILCS §5/42. In addition to the above, IEPA has the authority to issue citations or initiate enforcement actions for documented violations of the State Water Quality Standards (35 IAC 302). State water quality

standards also apply to sites smaller than one acre regardless of whether or not they are required to have an NPDES permit.

The Rivers, Lakes, and Streams Act and Illinois Rivers and Harbors Act give the IDNR jurisdiction over all waterbodies in the State, navigable and non-navigable and authorize the Agency to ascertain to what extent, if at all, these waters and shorelines have been or are proposed to be encroached upon by private interests or individuals. The Act gives IDNR authority to either recover full compensation for wrongful encroachment, or to recover the use of the same. The IDNR OWR is responsible for the review of Joint Permit applications and has enforcement authorities. Under the Rivers, Lakes, and Streams Act, illegal discharge is punishable as a Class A misdemeanor (615 ILCS §5/18). OWR has the authority to issue permits for construction in floodplains and floodways and has related enforcement authority.

Wetlands that are designated Nature Preserves are protected by the Illinois Nature Preserves Commission. The Commission and IDNR implement the Natural Areas Preservation act, which allows for consultation and review of projects that can impact high quality natural areas.

IDNR also has authority to conduct a comprehensive review on actions funded or performed by IDNR for environmental and historical impacts. Projects expected to have negative impacts on wetlands can be halted until the project proponent agrees to modifications to minimize or mitigate impacts. IDNR has the power to enforce the laws of the State and the rules and regulations of the Department in or on any lands owned, leased, or managed by the Department (20 ILCS §805/805-515).

MWRD has the authority and the responsibility for administering the Cook County Watershed Management Ordinance. This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit.

LCSMC has the authority and the responsibility for administering the Lake County Watershed Development Ordinance (WDO). This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit. Legal action may be taken and a notice of the violation may be recorded to the title to the property. LCSMC is available to meet with communities to provide technical assistance on WDO related issues at any time. LCSMC also has delegated authority from the OWR for enforcement of Part 3708 of the Rivers, Lakes and Streams Act (17 IAC 3708).

7.3.3 Management Measure for Vegetated Treatment Systems

The objective of this management measure is to promote the use of engineered vegetated treatment systems such as constructed wetlands or vegetated filter strips where these systems will serve a significant nonpoint source pollution abatement function. Vegetated treatment systems (VTS), including vegetated filter strips and constructed wetlands, are designed to reduce nonpoint source pollution. They need to be properly designed, correctly installed, and diligently maintained in order to function properly.

Vegetated filter strips (VFS) remove sediment and associated pollutants from runoff and wastewater by filtration, deposition, infiltration, absorption, adsorption, decomposition, and volatilization, thereby reducing the amount entering surface waters. VFS are appropriate for areas adjacent to surface waters that are receiving polluted runoff and improve water quality by removing nutrients, sediment, suspended solids, and pesticides. VFS are most efficient when contaminated runoff flows over vegetation as a uniform sheet. When the runoff concentrates in channels the VFS will not function optimally. Important design features of VFS include:

- A device such as a level spreader that ensures that runoff reaches the vegetated filter strip as a sheet flow
- A dense vegetative cover of erosion-resistant plant species
- A gentle slope of no more than five percent
- A length at least as long as the adjacent contributing area

Constructed wetlands are engineered complexes of saturated substrates, emergent and submerged vegetation, and water that simulate wetlands. Important features of constructed wetlands include:

- Substrates with various rates of hydraulic conductivity
- Plants adapted to water-saturated anaerobic substrates
- Water flowing through or above the substrate
- Aerobic and anaerobic microbial populations

Existing Programs or Practices and Lead Agencies

Programs and activities that are being implemented for this management measure are described below.

Regulatory Programs

The **Interagency Wetland Policy Act of 1989** (20 ILCS 830) directs that, where possible, state agencies should “preserve, enhance, and create wetlands.” It also sets a goal of zero net loss of existing wetlands, or their value, from State supported activities. It accomplishes this by requiring State agencies to make wetland preservation a priority in all of their construction and land management plans. Where there is no feasible alternative to wetland degradation, that loss must be offset through the implementation of a Wetland Compensation Plan. This act creates an Interagency Wetlands Committee including IDNR, IEPA, Illinois Department of Agriculture, Illinois Department of Transportation, Illinois Historic Preservation Agency, Illinois Department of Commerce and Economic Opportunity, and the Capitol Development Board. The goal of the act is to ensure no net loss in wetlands due to state-supported activities, through the development of agency action plans and establishing a mitigation policy

<http://www.dnr.illinois.gov/adrules/documents/17-1090.pdf>

(https://dnr.state.il.us/wetlands/iwc_intro.htm and <https://dnr.state.il.us/wetlands/ch6e.htm>).

The **Comprehensive Environmental Review Process (CERP)** is an internal IDNR process to review 1) actions that the department performs or funds, 2) actions that the Department approves and tax

incentive is provided, or 3) actions that occur on IDNR-owned or leased land. An action is any activity that may change the existing physical, chemical, or biological conditions of the air, land, or water. Channelization activities which fit any of the three criteria above are reviewed for potential impact on threatened or endangered species, high value natural areas, wetlands, cultural resources, and other resources such as migratory birds, fisheries, forests, prairies, streams, and riparian corridors. Actions that may cause significant alterations to lakes or streams require a public review period. Certain activities such as controlling nuisance aquatic vegetation; transplanting native aquatic or semi-aquatic plants to establish cover, increase habitat diversity and prevent erosion; and maintaining existing levees and water control structures are exempt from review under most circumstances. (<http://dnr.state.il.us/orep/docs/CERPmanual.pdf>)

The **Cook County Watershed Management Ordinance** (55 ILCS §5/5-1062.1; 70 ILCS 2605/1 *et. seq.*) is administered to abate the negative impacts of stormwater runoff (e.g. flooding, erosion, water quality impairments, etc.) from developments or redevelopments. Article 6 of the Ordinance mandates special protections for floodplains, wetlands, wetland buffers, and riparian areas. The Ordinance requires that development in floodplains cannot increase flood velocity, impair hydrologic function, or degrade water quality. Article 6 has several elements that protect wetland and riparian areas, both of which attenuate the impacts of flooding and erosion. The Ordinance requires that developers must provide the District with the boundaries, extent, function, value, and quality of all wetlands on site. Development that impacts flood boundaries, water quality or wetlands is discouraged by the WMO, but mitigation of unavoidable impacts is allowed in some cases. Mitigation practices may include vegetated treatment systems and constructed wetlands or other similar measures, and as such this program supports the requirements of this management measure. Technical specifications are contained in the Technical Guidance Manual, which complements the ordinance.

(https://www.mwrd.org/pv_obj_cache/pv_obj_id_4985C2CD4FAB1ABFC7726C7E8F2A7E3E199B7200/filename/WMO.pdf)

The **Lake County Watershed Development Ordinance** (55 ILCS §5.5-1062) also generally requires a Watershed Development Permit for developments in floodplains, wetlands, or depressional storage areas. The Ordinance is intended to protect water resources, including flood boundaries, water quality or wetlands. Unavoidable impacts require mitigation plans, which can include vegetated treatment systems or wetlands. For example, the ordinance requires that restoration of a wetland on the site of a historic wetland receives more credit as wetland mitigation than creation of a wetland elsewhere. As such this program supports the requirements of this management measure. (<http://www.lakecountyil.gov/stormwater/floodplainstormwaterregulations/wdoandtrm/Pages/watersheddevelopmentordinance.aspx>)

Education, Public Outreach and Technical and Financial Assistance

The **Illinois Urban Manual** (<http://www.aiswcd.org/ium/>) was originally developed by the IEPA and is currently hosted and continually updated by the Association of Illinois Soil and Water Conservation Districts through funding from Section 319 of the Clean Water Act. This manual is the go-to technical

reference on best management practices for soil erosion and sediment control, stormwater management, and special area protection. It is used by developers, planners, engineers, government officials and others involved in land use planning, building site development, and natural resource conservation in rural and urban communities and developing areas, including the Illinois Coastal Zone. The manual has guidance on best management practice selection, construction specifications, material specifications, and provides standard drawings. The manual includes a thorough discussion of wetland creation and restoration best management practices. Extensive technical information is available on how to create a hydrologic regime similar to the type of wetland being restored, successfully plant native species from local ecotypes to ensure species diversity and survival, and plan and conduct restoration so that the result will be equivalent to a naturally occurring wetland ecosystem. For example, the manual provides guidance on when to use seeds versus plugs, talks about options for restoring hydrology, and provides guidance on the wildlife habitat considerations in play when making decisions on water control structures (See IUM practices standards 998 through 999, <http://www.aiswcd.org/ium/practice-standards/>). The **Illinois Urban Manual Practice Standard 997 Wetland Creation** provides detailed technical guidance on the creation of wetlands where no natural wetland occurred historically and which contain soils that are not hydric. The **Illinois Urban Manual Practice Standard 800 Bioretention** provides detailed technical guidance on the construction of bioretention facilities. This includes information on best practices for soils, vegetation, inflow design, etc. http://www.aiswcd.org/wp-content/uploads/2013/06/urbst800_FINAL1.pdf. The **Illinois Urban Manual Practice Standard 835 Filter Strip** provides details on the installation of filter strips. It specifies recommended slopes, the use of level spreaders to achieve sheet flow, and soil and vegetation. <http://www.aiswcd.org/wp-content/uploads/2013/06/urbst83511.pdf>

The **Illinois Wetland Restoration and Creation Guide** is a technical guide that was prepared by the Illinois Natural History Survey in 1997. It provides detailed information on how to plan wetland restoration and creation projects, with a strong focus on designing the hydraulic regime, selecting and planting native vegetative species, and monitoring the ecosystem functions of the restored or created wetland. (<http://www.dot.state.il.us/desenv/environmental/IllinoisWetlandRestorationAndCreationGuide.pdf>)

The **Cook County Technical Guidance Manual**, created by MWRD, is a companion to the Cook County WMO. It intended to provide information required in support of a Watershed Management Permit, provide guidance to best achieve the WMO's requirement and provide examples to meet the requirements of the WMO. It builds upon the guidance provided in the Illinois Urban Manual. (https://www.mwrdd.org/iri/go/km/docs/documents/MWRD/internet/protecting_the_environment/Stormwater_Management/Pdfs/WMO/TGM/TGM.pdf). Likewise, the **Lake County Technical Reference Manual** is a companion to the Lake County WDO. It is intended to assist applicants who are seeking to comply with the WDO. It includes technical background and reference information, direction to assist in uniform and comprehensive permit applications, design guidelines, information as a useful resource for planning purposes, and interpretation for the WDO. Both of these manuals provide detailed information on best management practices and requirements, including practices which can be applied to meet the

goal of balancing the balancing improvements to wetland water quality functions with their other functions such as providing wildlife habitat.

Illinois Green Infrastructure Grant Program for Stormwater Management (IGIG) is a grant program administered through the IEPA. Since 2011, approximately \$15 million has been made available to local units of government and other organizations to demonstrate green infrastructure best management practices to control stormwater runoff for water quality protection. Projects are located within Municipal Separate Storm Sewer System (MS4) or Combined Sewer Overflow (CSO) areas. Examples of projects funded include vegetated swales, stormwater wetlands, green roofs, tree infiltration boxes, rain gardens, and vegetated filter strips. The application process requires detailed information about the expected improvements to water quality and reduction in runoff volume from the project. <http://www.epa.state.il.us/water/financial-assistance/publications/igig-progress-report.pdf>

IDNR has a **Natural Areas Acquisition Fund** which provides funding for the agency's purchase, protection, restoration and stewardship of high quality natural areas including wetlands (<https://dnr.state.il.us/wetlands/CH5D.HTM>).

New in 2013, the **Chi-Cal Rivers Fund** is a private-public partnership which funds projects to enhance in stream habitat for aquatic life within the CAWS. IDNR is one of the major funders. Funded projects may include riverbank naturalization, bank stabilization, riparian buffer planting, in-stream structure installation, and restoration of wetlands, prairies, and forests adjacent to watercourses. Green infrastructure such as bioswales are also eligible for funding. www.nfwf.org/chi-cal

In summary, the Vegetated Treatment System Management Measure will be effectively implemented through these primary regulatory and non-regulatory programs:

1. Lake and Cook County ordinances that require that adverse impacts to riparian areas and wetlands be mitigated. Mitigation may include vegetated treatment systems, and,
2. The Illinois Urban Manual provides technical guidance on vegetated treatment system implementation
3. National, state and local agencies have a number of programs to support planning and construction of this management measure.

All programs used to implement this measure are listed in Table 7-3. This table summarizes the programs; authorizing legislation; program authority; lead agency enforcement mechanisms; and evaluation methods.

Enforcement Mechanisms

Wetland or water quality mitigation may be required by special permit conditions, and vegetated treatment systems might be part of a mitigation plan. IDNR has the power to enforce the laws of the State and the rules and regulations of the Department. Enforcement in the coastal zone will be coordinated with MWRD and/or LCSWC compliance officers.

MWRD has the authority and the responsibility for administering the Cook County Watershed Management Ordinance. This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit.

LCSMC has the authority and the responsibility for administering the Lake County Watershed Development Ordinance (WDO). This includes inspections to ensure compliance, issuance of fines, placing a stop-work order, or revoking a permit. Legal action may be taken and a notice of the violation may be recorded to the title to the property. LCSMC is available to meet with communities to provide technical assistance on WDO related issues at any time. LCSMC also has delegated authority from the OWR for enforcement of Part 3708 of the Rivers, Lakes and Streams Act (17 IAC 3708).

Table 7-3 Management Measure Programs and Practices for Wetlands, Riparian Areas and Vegetated Treatment Systems

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measure
401 Water Quality Certification	Environmental Protection Act (415 ILCS 5/) Federal Water Pollution Control Act Rivers and Harbors Act of 1899	35 IAC 302.395 33 CFR 1251-1387	Illinois Environmental Protection Agency	Issuance of Water Quality Certification. Issuance of cease and desist orders, orders requiring remediation, administrative penalties, criminal penalties, civil penalties.	Number of 401 certifications	7.3.1, 7.3.2
Acres for Wildlife Program			Illinois Department of Natural Resources			7.3.1, 7.3.2
Agricultural Conservation Easement Program- Wetland Reserve Easements			US Department of Agriculture's Natural Resources Conservation Service			7.3.1, 7.3.2

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measure
Chi-Cal Rivers Fund			National Fish and Wildlife Foundation			7.3.2, 7.3.3
Chicago Wilderness Green Infrastructure Vision			Chicago Wilderness			7.3.1
Cook County Watershed Management Ordinance	55 ILCS 5/5-1062.1, 70 ILCS 2605/1 et seq.	70 ILCS 2605/1	Metropolitan Water Reclamation District of Greater Chicago (or authorized municipality)	<p>Issuance of permit.</p> <p>Permittees are required to monitor for 5 years post-construction and submit water quality data to MWRD.</p>	MWRD will evaluate data for effectiveness	7.3.1, 7.3.2, 7.3.3
Cook County Technical Guidance Manual			Metropolitan Water Reclamation District of Greater Chicago			7.3.1, 7.3.2, 7.3.3

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measure
Environmental review of projects	<p>Rivers, Lakes, and Streams Act (615 ILCS 5/)</p> <p>Interagency Wetland Policy Act Of 1989 (P.A. 86-157)</p> <p>Fish and Wildlife Coordination Act (16 USC 661-664)</p> <p>Regulation of Public Waters Act</p> <p>National Environmental Policy Act (40 CFR 1500-1508)</p>	<p>17 IAC 3704</p> <p>17 IAC 3704</p>	IDNR	<p>Issuance of approvals.</p> <p>Issuance of orders requiring remediation administrative penalties, criminal penalties, civil penalties.</p>	Number of approvals issued	7.3.1, 7.3.2, 7.3.3

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measure
Forest Preserve Districts and municipal park districts	55 ILCS 5/5-1062	70 ILCS 2605/1	Cook County Forest Preserve District, Lake County Forest Preserve District	Land preservation and management	Acreage	7.3.1, 7.3.2
GO TO 2040	Public Act 095-0677		Chicago Metropolitan Agency for Planning			7.3.1
Illinois Green Infrastructure Grant Program for Stormwater Management			Illinois Environmental Protection Agency		Number of green infrastructure projects completed	7.3.3

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measure
Illinois Department of Natural Resources Grant Programs- PARC, OSLAD, Land and Water Conservation Fund, IDNR Special Wildlife Funds	525 ILCS 33 36 CFR 59 525 ILCS 35 520 ILCS 5 Public Act 96-820 20 ILCS 805	17 ILCS 3025 17 ILCS 3030 17 ILCS 3060 17 ILCS 3070	Illinois Department of Natural Resources		Number of acres of wetland or riparian land purchased or restored	7.3.1, 7.3.2
Illinois Nature Preserves Commission	525 ILCS 30	17 ILCS 4000	Illinois Department of Natural Resources			7.3.1, 7.3.2

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measure
Illinois Urban Manual			Association of Illinois Soil and Water Conservation Districts			7.3.1, 7.3.2, 7.3.3
Illinois Wetland Restoration and Creation Guide			Illinois Natural History Survey, University of Illinois			7.3.2, 7.3.3
Interagency Wetland Policy Act of 1989	20 ILCS 830	17 ILCS 1090	IDNR, in partnership with IEPA, IDO, IDOT, Illinois Historical Preservation Agency, Illinois Department of Commerce and Economic Opportunity, and the Capitol Development Board	Implementation of a wetland compensation plan, Issuance of approvals. Issuance of orders requiring remediation administrative penalties, criminal penalties, civil penalties.	No net loss of wetlands due to state sponsored activities	7.3.1, 7.3.2, 7.3.3

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measure
Joint Permit Program	<p>Rivers and Harbors Act</p> <p>Federal Water Pollution Control Act</p> <p>Illinois Rivers, Lakes, and Streams Act</p>	<p>33 CFR 322</p> <p>33 CFR 1251-1387</p> <p>17 IAC 3708</p> <p>17 IAC 3704</p> <p>33 CFR 323</p>	US Army Corps of Engineers, in partnership with IEPA and IDNR	Issuance of permits. Issuance of cease and desist orders, orders requiring remediation, administrative penalties, criminal penalties, civil penalties.	Number of permits issued	7.3.1, 7.3.2
Lake County Watershed Development Ordinance	55 ILCS 5/5-1062	70 ILCS 2605/1	Lake County Stormwater Management Commission (or authorized municipality)	Issuance of permit. *** Permittees are required to monitor for 5 years post-construction and submit water quality data to LCSMC.	LCSMC will evaluate data for effectiveness	7.3.1, 7.3.2, 7.3.3

Program or Practice	Authorizing Legislation	Program Authority	Lead Implementing Agency	Enforcement Mechanism(s)	Evaluation Method(s)	Management Measure
Lake County Technical Manual			Lake County Stormwater Management Commission			7.3.1, 7.3.2, 7.3.3
National Coastal Wetlands Conservation Grant Program	Coastal Wetlands Planning, Protection and Restoration Act of 1990		US Fish and Wildlife Service			7.3.1, 7.3.2
IDNR Natural Areas Acquisition Fund			Illinois Department of Natural Resources		Number of acres of wetland or riparian land purchased or restored	7.3.1, 7.3.2, 7.3.3